Virginia City Hybrid Energy Center
Response to Data Request
Bruce Buckheit, Member, Virginia Air Pollution Control Board

Question (Page No. 7):

Summarize readily available data concerning adverse environmental impacts of gob and coal waste piles, especially as that data may distinguish between newly generated waste piles and historic waste piles. If there is no such data, simply indicate that fact.

Response:

There are adverse environmental impacts from creating gob piles or leaving them in place. These adverse environmental impacts support the use of CFB technology which can eliminate existing gob piles and prevent future gob piles by eliminating the need for washing. The impacts largely come from increased sedimentation of streams from coal fines in the gob and acid mine drainage from partially combusted gob. Appalachian Technical Services, Inc. (ATS) conducted a study in September 2007 on the sediment leaching potential of an 11 acre abandoned waste coal pile in Wise County, Virginia (Attachment 1). The study states:

> "This coal refuse pile was created by deep mining activities conducted at Stonega Coal and Coke Company beginning in the early 1920's and continuing until the mid 1960's prior to the enactment of the Federal Surface Mining Control and Reclamation Act. The pile was created by hauling coal refuse and dumping the material into a small tributary of Callahan Creek. Over the years, approximately 100 feet of coal refuse was deposited in the center of the tributary's hollow. The downslope toe of this refuse pile rested directly on the banks of Callahan Creek. The pile was subsequently abandoned with no effort at reclamation. During the 'coal boom' of the mid 1970's, most of the material in the pile was removed and sold because it contained enough coal to be burned in a power plant. However, a layer of refuse near the original ground surface was left in place. This existing refuse layer varies from less than a foot in thickness near the edges of the pile to over 20 feet near the center of the original hollow.
>
> The refuse layer is highly erodible due to the fine particle size and elevated coal content and the potential for spontaneous combustion is also present. Evidence that combustion already occurred in the past is visible in the pockets of reddish-colored burned material present in the pile and visible in some photographs. Further oxidation of this material could result in the formation of acid-mine drainage (AMD) and the subsequent release of metals into Callahan Creek.

> Based on test pit results, the average thickness of the pile is approximately six feet. The pile covers approximately 11 (eleven) acres of surface area. Based on these measurements, it is estimated that mitigation of the pile will require removal of approximately 71,000 cubic yards of material.
>
> The coal refuse material remaining in the pile is highly erodible, as depicted by the photographs of the large gully traversing the center of the pile. In places, this gully reaches up to 20 feet in depth and up to 40 feet in top width, with nearly vertical side slopes. Surveyed measurements of the gully indicate greater than 12.3 million kg (5.6 million lbs) of sediment has eroded from the gully since it was abandoned for the second time in 1978. This volume does not account for the additional material that would have been transported from the adjacent watershed slopes or the material that is actively eroding from the area of the pile resting directly on the stream bank. Based on the gully volume alone and the period of time since the second abandonment (29 years ago), approximately 424,515 kg (192,611 lbs) per year total or 38,593 kg (17,510 lbs) per year per acre of sediment has eroded from this refuse pile. Transport of this material into Callahan Creek is evident from the photographs of the resulting delta of sediment which has built up in the stream where the gully empties into Callahan Creek.
>
> Based on the information given above we believe the environmental benefits of removing this material and restoring this hollow to its natural condition are obvious. Material removal will begin at the bottom of the pile adjacent to Callahan Creek. Once sufficient material has been removed, a sediment pond will be constructed to capture sediment generated by removal of the remaining coal refuse. NMS proposes to remove all the refuse material from the pile (with the possible exception of a small "island" to support an existing power line support) down to natural soil material. Where the coal content is high enough, the material will be sold as fuel. Otherwise, it will be disposed of in an existing adjacent refuse disposal facility. The area will then be vegetated and a stable stream channel will be re-established to carry runoff through the site."

The data clearly shows the environmental impact that just one pile is still causing after more than 80 years. Given that there are hundreds of abandoned waste coal piles in southwest Virginia and this one pile alone is leaching upwards of 200,000 lbs of sediment, dissolved solids, and acids per year into the adjacent watershed, it is obvious that waste coal piles are leaching millions of pounds of sediment into the streams and rivers of southwest Virginia annually and causing environmental impairment to aquatic species in the region.

Current coal waste disposal practices are discussed in response to comment number 6.

ATTACHMENT 1

Appalachian Technical Services, Inc.
ENGINEERING, ARCHITECTURE, SURVEYING & ENVIRONMENTAL SCIENCE

October 8, 2007

Mr. Mike Smith
Virginia Division of Mined Land Reclamation
P.O. Drawer 900
Big Stone Gap, Virginia 24219

RE: TMDL Offset Proposal -- Nine Mile Spur LLC (DMLR Application No. 1003342)
Callahan Creek Watershed, Wise County, Virginia

Dear Mike:

On behalf of our client, Nine Mile Spur, LLC (NMS), we hereby submit our TMDL offset proposal for the referenced surface mine permit application.

Proposed Additional Mining Waste Load

The subject application proposes one new NPDES point source outfall (003) and an increased flow to an existing outfall (002 on adjacent Permit Number 1201805), both of which will discharge into Callahan Creek, a TMDL stream. Proposed new Outfall 003 will drain 16.42 acres and the additional drainage proposed for existing Outfall 002 on adjacent Permit Number 1201805 will be 295.36 acres after excluding previously mined areas from each watershed in accordance with the established DMLR procedure for mining waste load calculation. DMLR's current load allocation methodology for proposed outfalls in Callahan Creek utilizes a runoff factor of 0.5 gpm per acre (based on typical reported flows in the watershed) and an assumed total suspended solids (TSS) concentration of 35 mg/l (based on the regulatory monthly average maximum). Based on these criteria, the proposed permit changes would add a total of approximately 10,857 kg/year of TSS load to Callahan Creek.

Proposed Offset Area Background

In order to offset for the anticipated load produced by this permit, NMS proposes to mitigate an abandoned coal mine refuse pile, located immediately adjacent to the proposed permit area, which drains directly into Callahan Creek. This coal refuse pile was created by deep mining activities conducted by Stonega Coal and Coke Company beginning in the early 1920's and continuing until the mid 1960's prior to the enactment of the Federal Surface Mining Control and Reclamation Act. The pile was created by hauling coal refuse and dumping the material into a small tributary of Callahan Creek. Over the years, approximately 100 feet of coal refuse was deposited in the center of the tributary's hollow. The downslope toe of this refuse pile rested directly on the banks of Callahan Creek. The pile was subsequently abandoned with no effort at reclamation. During the "coal boom" of the mid 1970's, most of the material in the pile was removed and sold because it contained enough coal to be burned in a power plant. However, a layer of refuse near the original ground surface was left in place. This existing refuse layer varies from less than a foot in thickness near the edges of the pile to over 20 feet near the center of the original hollow.

The refuse layer is highly erodible due to the fine particle size and elevated coal content and the potential for spontaneous combustion is also present. Evidence that combustion already occurred in the past is visible in the pockets of reddish-colored burned material present in the pile and visible

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in some of the photographs (attached). Further oxidation of this material could result in the formation of acid-mine drainage (AMD) and the subsequent release of metals into Callahan Creek.

Offset Area Characterization

NMS conducted site characterization activities in September, 2007 in order to delineate the areal extent of the mine refuse pile and quantify its volume. Engineering technicians dug test pits to determine the thickness of the pile and surveyed its extents as well as the extent of the gully formed in its center. A map of the pile in its current configuration is attached as well as cross-sections generated by recent surveys of the pile. Photographs of the pile are also attached.

Based on test pit results, the average thickness of the pile is approximately six feet. The pile covers approximately 11 (eleven) acres of surface area. Based on these measurements, it is estimated that mitigation of the pile will require removal of approximately 71,000 cubic yards of material.

The coal refuse material remaining in the pile is highly erodible, as depicted by the photographs of the large gully traversing the center of the pile. In places, this gully reaches up to 20 feet in depth and up to 40 feet in top width, with nearly vertical side slopes. Surveyed measurements of the gully indicate greater than 12.3 million kg of sediment has eroded from the gully since it was abandoned for the second time in 1978. This volume does not account for the additional material that would have been transported from the adjacent watershed slopes or the material that is actively eroding from the area of the pile resting directly on the stream bank. Based on the gully volume alone and the period of time since the second abandonment (29 years ago), approximately 424,515 kg per year total or 38,593 kg per year per acre of sediment has eroded from this refuse pile. Transport of this material into Callahan Creek is evident from the photographs of the resulting delta of sediment which has built up in the stream where the gully empties into Callahan Creek.

Based on the information given above, we believe the environmental benefits of removing this material and restoring this hollow to its natural condition are obvious. Material removal will begin at the bottom of the pile adjacent to Callahan Creek. Once sufficient material has been removed, a sediment pond will be constructed to capture sediment generated by removal of the remaining coal refuse. NMS proposes to remove all the refuse material from the pile (with the possible exception of a small "island" to support an existing power line support) down to natural soil material. Where the coal content is high enough, the material will be sold as fuel. Otherwise, it will be disposed of in an existing adjacent refuse disposal facility. The area will then be revegetated and a stable stream channel will be re-established to carry runoff through the site.

Offset Ratios and Calculation

Based on the approved Callahan Creek TMDL report, Abandoned Mine Lands (AML) such as the subject refuse pile generate approximately 7,162 kg per year of eroded sediment per acre of disturbance. This modeled sediment contribution rate is considerably less than the estimated sediment contribution for this type of highly erodible material based on our analysis of the gully erosion given above. However, NMS is willing to accept the approved AML waste load of 7,162 kg per year per acre; therefore, completion of this project should result in the elimination of a permanent source of approximately 78,782 kg per year of TSS load to Callahan Creek. This far exceeds the 10,857 kg/year of additional temporary mining waste load anticipated to be generated by the proposed outfalls. In addition to the overall reduction of TSS loading resulting from the coal refuse pile mitigation project, other beneficial environmental effects will result as well. These include removal of a potential AMD source, removal of material which has a potential for spontaneous combustion, creation of a stable stream channel where only an eroding gully now

exists, improved aesthetics, improved vegetative cover for wildlife habitat and potential improvement in total dissolved solids (TDS) concentrations entering Callahan Creek from this site.

For these reasons (and in consideration of NMS's acceptance of the TMDL modeled load vs. the actual calculated load discussed above) and also due to the project's extremely close proximity to Callahan Creek, we believe a low offset ratio is warranted. By applying an offset ratio of 1.20 to this project, NMS would be required to offset 10,857 x 1.20 = 13,028 kg/year of TSS load.

Once the mitigation project has been completed, the appropriate TSS load credits will be allocated to NMS for the proposed mining activity and any remaining credit will be reserved for future mining activities conducted by NMS (or its affiliated companies) within the Callahan Creek watershed. Since the proposed project will remove 78,782 kg/year of TSS load from Callahan Creek, we propose to reserve the difference (65,754 kg/year) for future projects of NMS and its affiliates.

We trust this proposal will meet the requirements of the TMDL regulations and ask that you forward this proposal on to EPA at your earliest convenience. If you should have any questions, please give me a call at 276-328-4200. We appreciate your consideration in this matter.

Sincerely Yours,

Phil Mullins

Phillip C. Mullins, PE
Senior Consultant